

The value of time of use tariffs

What are time of use tariffs?

A tariff is a pricing plan for energy use. Time of use tariffs use different prices to encourage consumers to use electricity at times when more is available cheaply. This can support a more flexible and sustainable electricity system.

The benefits and risks for consumers

Consumers could benefit from lower prices under time of use tariffs, particularly if they can shift their electricity use. But there are risks that the complexity of these tariffs could lead to higher costs for consumers.

Our research

As the consumer advocate, we wanted to understand these potential benefits and risks. There is a lack of evidence about how willing consumers in the UK would be to adopt these tariffs and whether they actually reduce costs.

We commissioned The Brattle Group and UCL to fill this gap. This report summarises our conclusions and recommendations.



**citizens
advice**

What we found

- Consumers are interested in time of use tariffs
- But without electric heating and cars the value of time of use tariffs to the system is modest. Real time pricing could provide much more value when combined with automated controls
- Reductions in overall costs to the electricity system were similar for each of the tariff designs we tested under current generation and demand conditions
- Increases in renewable energy generation would not mean that the time of use tariffs in this study have significantly greater system value

What policy makers should do

1. Continue building the infrastructure to enable time of use tariffs, for example by rolling out smart meters, but don't directly encourage consumers to switch to them yet
2. Prioritise simpler time of use tariff designs and giving consumers information to make choices that are right for them
3. Protect consumers from increased bills, for example through trialling the use of critical peak rebates

Without electric heating and cars the value of time of use tariffs is modest

£19m a year

would be saved if static TOU tariffs were introduced under current trends.

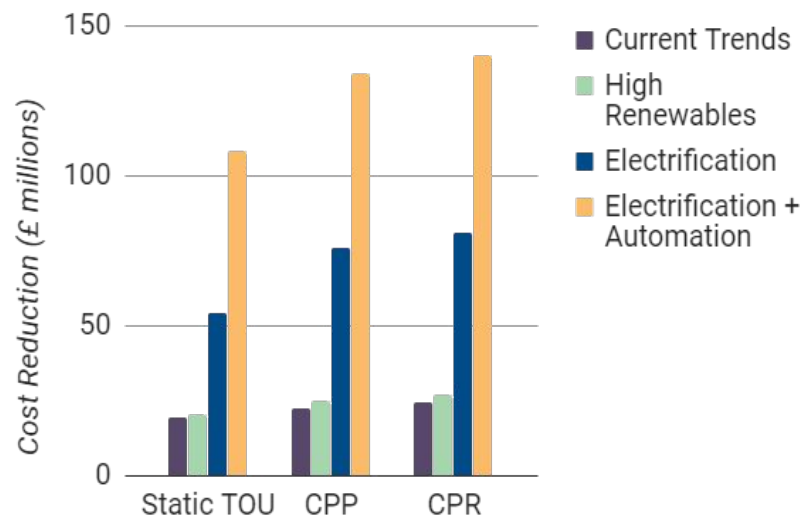
This is an average saving of around £5 a year for households on time of use tariffs, if consumers captured all the savings.

This is based on 20% of people adopting a static TOU tariff and reducing their peak demand by 5%.

In practice, these savings would have to be shared between suppliers, energy networks and consumers.

Electric heating and cars lead to much greater cost reductions

Increased electricity demand from cars and heating means increased costs to build capacity. Peak demand reductions then provide greater savings. If this electricity demand can be automatically controlled, larger peak demand reductions will be possible.

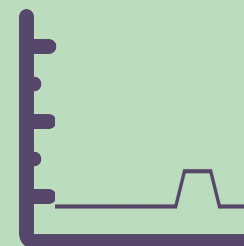


Increases in renewable energy generation would not mean that the time of use tariffs in this study have significantly greater system value

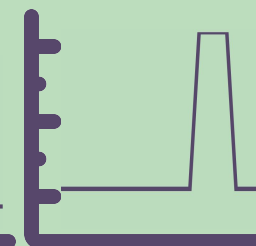
Renewable energy reduces the market price of energy but is not predictably available at peak demand. This increases costs of investment in electricity generation.

Reduction in peak demand can then result in greater savings. Time of use tariffs reduce costs in our High Renewables scenario by **£20-27m a year**.

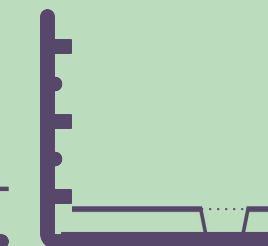
We looked at these tariffs...



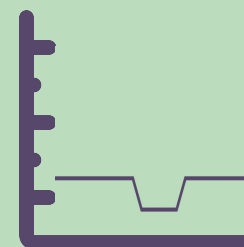
Static time of use (TOU)
Every day



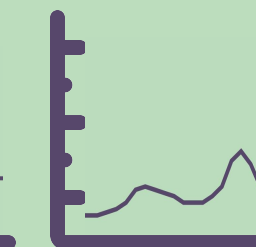
Critical Peak Pricing (CPP)
Critical Peaks: up to 18 days a year



Critical Peak Rebate (CPR)



Inverted TOU (iTOU) *Summer*



Real Time Pricing
Every day

...in these scenarios

Current Trends	Only commonly expected changes, e.g. retirement of coal
High Renewables	+30 - 40% wind & solar capacity
Electrification	+6 million heat pumps (HP) & 8 million electric vehicles (EV)
Electrification + Automation	++half HPs & EVs automatically controlled

Reductions in overall costs to the electricity system were similar for each of the tariff designs we tested current generation and demand conditions

In scenarios developed from current trends, or with expanded use of renewable generation, the savings from different tariff types were broadly similar, falling in the range of **£22 - 24m a year**. The value was affected much more by assumptions about electricity demand patterns, than by the specific design of the tariff.

Automation and real time pricing could provide much more value

Most consumers cannot currently respond to the half hourly price changes. If automation controlling electric vehicles, heating and other appliances allowed this to happen, the value of time of use tariffs could increase to **£272 m a year**.

There are a range of other factors influencing consumer uptake of these automated technologies. Time of use tariffs could create another benefit to encourage uptake of these.

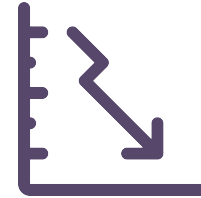
Inverted TOU could help local areas

In sunny areas, solar panels can generate too much energy on summer days. An inverted time of use (iTOU) tariff encourages consumers to use energy at sunny times. This can have significant benefits in local areas. Consumers on a tariff designed to reduce winter peak could also access an iTOU in summer.

Consumers are interested in time of use tariffs, but may not always benefit



20%
of people
would choose
a TOU over a
flat rate



5-10%
Of peak
demand
reduced if on
TOU



75%
of participants
in trials were
happy at the
end



25 - 40%
of people
faced higher
bills in recent
UK trials

Polling results are based on a direct survey of nearly 3000 UK electricity customers.

Consumers may not be able to accurately compare time of use tariffs

Consumers may be attracted by a cheap electricity rate or a tariff which appears 'fair', or transparent.

However, those cheap rates may only be available a few days a year, or consumers may not be able to move their demand.

A tariff with a cheap rate may end up more expensive.

A clear and available way to compare tariffs needs to be developed before they become widespread.

Vulnerable consumers may struggle to receive benefits from time of use tariffs

Younger & better off people show more preference for time of use tariffs.

Vulnerable consumers may not choose time of use tariffs or be able to purchase automated electrical equipment to reduce their bills.

Different vulnerabilities may help or hinder the ability to benefit from time of use tariffs.

Development of the tariffs should include explicit protection for vulnerable consumers to ensure they are not worse off than they currently are under flat tariff structures.

Time of use tariffs deliver larger savings with more consumers enrolled on them

Encouraging consumers to adopt time of use tariffs will be crucial to realising cost savings. Other countries have increased participation rates by introducing opt out time of use tariffs. Even with lower reduction in peak demand per consumer, this results in greater aggregate demand reduction, so greater system-wide savings.

However, there are significant risks that this would leave consumers who are unable to change their time of electricity use facing higher costs.

The most consumer friendly tariff: critical peak rebate

This tariff pays consumers to reduce consumption on particular peak days.

There is **no loss** for consumers because costs do not increase for if they don't reduce their demand.

It delivers a similar level of value to other tariff types.

It has been successfully trialled in other countries but not in the UK. Our research suggests that it's a consumer friendly option which suppliers and policymakers should study and trial in the UK.

What does this mean for policy?

Government and industry should continue building the infrastructure to enable time of use tariffs, for example by rolling out smart meters, but shouldn't directly encourage consumers to switch to them yet

In the near term, policy makers should continue to work to enable uptake of both smart home technologies and time of use tariffs. This includes delivering the half hourly settlement program and smart meter roll out.

There should not yet be a regulatory push to move consumers on to time of use tariffs.

Prioritise simpler time of use tariff designs and giving consumers information to make choices that are right for them

Time of use tariffs will increase complexity and could increase costs for some consumers. Offering simpler tariffs will make comparison easier. Comparison tools also need to be available to help consumers understand which tariffs are right for them.

Protect consumers from increased bills, for example by trialling critical peak rebate tariffs.

Suppliers should also consider options such as no-exit fee switching for consumers in the early months of a contract, to allow consumers to leave if results do not turn out as well as they expected.